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ABSTRACT

The interactional teaching patterns of 36 fathers and mothers with their 6-year-old sons and daughters were studied. Parents were asked to play (in parent-child dyads) with their child on a jigsaw puzzle and to teach the child to remember 25 picture cards that could be divided into conceptual categories. It was found that parents' instructional behaviors did not differ as a function of their own sex but rather on the basis of their child's gender. Parents attempted to teach their sons more general problem-solving strategies, and were both more directive and more approving or disapproving of sons than of daughters. Female children, by contrast, were interacted with in a more cooperative, concrete, and specific fashion than were male children and were given more feedback about their performance. In addition, the teaching interaction was found to be effective in terms of helping the child remember more items than were recalled without training. Several explanations for these sex of child effects are proposed. (Autnor/RH)

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Does Father Know Best? Mothers and Fathers Teaching their Preschool Sons and Daughters

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Abstract

The interactional teaching patterns of thirty-six fathers and mothers with their six-year-old sons and daughters were studied. Parents were asked to play with their child on a jigsaw puzzle and to teach the child to remember twenty-five picture cards that could be divided into conceptual categories. It was found that parents' instructional behaviors did not differ as a function of their own sex but rather on the basis of their child's gender. Parents attempted to teach their sons more general problem-solving strategies, and were both more directive and more approving or disapproving of sons than daughters. Female children, by contrast, were interacted with in a more cooperative, concrete, and specific fashion than male children and were given more feedback about their performance. In addition, the teaching interaction was found to be effective in terms of helping the child remember more items than were recalled without training. Several explanations for these sex of child effects are proposed.

There has been considerable recent interest in the delineation of those variables which relate the quality of interaction between parents and their children to the cognitive performance of the child. Previous research, concentrating primarily on the role of the mother, has demonstrated that socioeconomic status is related to the interactional teaching patterns within the dyad when mothers are asked to teach their prechool children a cognitive task (e.g., Bee, Van Egeren, Striessguth, Nyman, & Lechie, 1969; Brophy, 1970; Hess & Shipman, 1965). In general, qualities of the mother's instruction and delivery of information such as a global teaching strategy, asking questions, showing approval, and supplying feedback have been positively related to the successful performance of the child.

In general, research in this area has concentrated on the mother as a first and primary parent and has largely ignored the role of the father as a contributor to the cognitive developent of the child. While several studies have found that mothers and fathers behave differently in play interactions with their infants (e.g., Clarke-Stewart, 1978; Lamb, 1976; Parke & O'Leary, 1976), there has been little research with regard to cognitive teaching variables involving fathers and preschool children.

Previous interactional research involving the father has concentrated upon the delivery of consequences (e.g., Margolin & Patterson, 1975) and the general style of behavior (e.g., Osofsky & O'Connell, 1972) parents use in a single type of task or with a single sex of child. No data are available on other aspects of the father-child

relationship such as the quality of instructional behaviors fathers use in comparison to mothers across different types of tasks. Furthermore, there has been no comprehensive parametric investigation of the way in which mothers and fathers act independently with each sex of child. Data are also lacking concerning the generalizability of parent interactions across different contexts. The present study involved the observation of mothers and fathers dyadically playing with their preschool sons and daughters using a jigsaw puzzle and then teaching the child a memory task.

Based upon previous research, it was anticipated that the quality of instruction, the types and levels of consequences administered, and the nonverbal quality of the parent's behavior should be investigated. Instructional quality was defined by two variables: instructional level and instructional style. The instructional level of the parent's behavior was defined as the degree to which a general grouping solution was offered, either emphasizing categorization (strategy) or the specific nature of the task (specific). The style of instruction was defined as the manner in which the parent communicated with the child (e.g., explaining, suggesting, and asking questions). In addition, the reactions of the parent to the child's behaviors (consequences) were also explored (e.g., approval, disapproval, and feedback). The parent could also interact nonverbally with the child by working on a different portion of the task (parallel), by offering verbal commands and no physical assistance (directive), or by helping the child with some aspect of the problem (cooperative).

The child's level of response to the parent, either in terms of grouping solutions or specific items, and the style of those responses were also of interest. The nonverbal response of the child involved either acceptance, rejection, or neutrality toward the parent. Additionally, the child's actual performance on the task as measured by recall and categorical clustering of the pictures and the number of puzzle pieces connected was assessed.

It was anticipated, based upon previous research (e.g., Margolin & Patterson, 1975; Osofsky & O'Connell, 1972), that parental interactional behaviors would vary on the basis of the parent's sex. Mothers were expected to be more directive, questioning, and strategy oriented than fathers. It was further expected that the parents would vary their administration of consequences on the basis of the child's gender, behaving in a more judgmental fashion with sons than daughters. The differences in interactional behaviors which should occur as a function of the parent's gender were also expected to influence the child's ultimate performance. Children were expected to connect more puzzle pieces while playing with their fathers, whereas higher memory performance was anticipated from those children taught by mothers.

METHODS

Subjects

The subjects were thirty-six parent-child dyads; nine dyads within each of the four combinations of fathers and mothers with sons and daughters. Twenty-eight subject pairs were selected from volunteers in Salt Lake City, Utah. The remaining eight parent-child pairs were

volunteers from a DeKalb County, Georgia public elementary school. Socio-economic characteristics of the Georgia and Utah subjects were middle level and similar. An equal number of the parent-child pairs from each location were assigned to each cell of the experiment. The entire procedure was conducted in the dyads' homes at a time convenient to the family.

Equipment and Materials

The play interaction involved the use of a "Peanuts" puzzle (Milton-Bradley Toys, #4382-6) which contained one hundred pieces. The teaching learning interaction made use of two sets of cards containing drawings of common objects. There were twenty-four 5 cm by 7.62 cm cards in each set divided into four conceptual categories: animals, kitchen utensils, transportations, and houses. The Peabody Picture Vocabulary Test (PPVT Form B) was administered to the child during the session. In addition, the parents were asked to take the Otis Mental Abilities Test as an index of their intelligence.

A tape recorder was used to record the interaction sessions. The recorder was equipped with a device which overlayed a short "beep" on the tape every fifteen seconds while simultaneously flashing a light for the experimenters to use when rating the nonverbal aspects of the interaction.

Procedure

The four phases of testing were conducted in a single session by two experiments:

PHASE 1: Parent and child were seated at a table at which the "Peanuts" jigsaw puzzle pieces were arranged face up along with the audio tape-recording equipment. The pair was instructed to "play with the puzzle in as natural a manner as possible". Subjects were informed that this was not a performance-oriented task and that there was no pressure to complete the entire puzzle in the eight minutes allocated. Both experimenters recorded the occurrence of the nonverbal behaviors in as unobtrusive a manner as the home setting allowed.

PHASE 2: Upon completion of the play interaction, one experimenter worked with the parent while the other experimenter took the child to another room. The parent was handed a set of the memory cards with the instructions to "study the pictures and try to remember as many of them as possible". No time limit was imposed on the parent's study time. Following this period of preparation, the cards were removed and the parent's recall of the picture names was recorded.

The child was instructed to name all of the twenty-four pictures one-by-one while looking at them. When all of the cards were named, the child was asked to study them and to remember as many pictures as possible. No time limit was imposed, and the child was asked to indicate readiness to recall the picture names. Recall and study time were recorded by the experimenter.

PHASE 3: In Phase 3, the parent was handed the same cards that he/she had used previously and was told to teach the child to remember them. No instructions were given concerning the manner of teaching. Eight minutes were allocated for the tape-recorded teaching task.

Following this time period, the pictures were removed and the child's recall of the card names was assessed.

PHASE 4: During this final portion of the session, one experimenter administered the PPVT to the child while the parent completed a demographic questionnaire and the Otis Mental Abilities Test.

Scoring the Interactions: Coding the Tapes

All of the audio tapes were scored by one of the experimenters. In addition, fourteen tapes were chosen at random and scored by an undergraduate student naive to the experimenter's expectations. Each category of behavior was checked off on a scoring sheet if it occurred at least once in a fifteen second interval. The definitions for parental and child verbal and nonverbal interactional behviors are shown in Table 1. The total number of intervals in which a given behavior occurred was

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Insert Table 1 about here

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divided by the total number of occurrences of all behaviors. This yielded the proportion score of a particular behavior in relation to all other behaviors.

The interval reliability, computed for fourteen of the tapes by dividing the number of agreements by the total number of intervals for each category, was high, with the range of these medians across categories from 66% to 100%. These reliabilities are reported in parentheses at the end of each behavioral description shown in Table 1 with the first number for the play session and the second for teaching.

Performance Measures. Recall--The total number of items recalled by the child, both before and after the interaction session. Clustering--The amount of organization displayed at output. The cluster index used was Cohen, Sakoda, and Bousfield's (Note 2) Ratio of Repetition, represented by $r/(n - 1)$ where r is the number of intra-category repetitions and n is the total amount recalled. Puzzle Pieces--The total number of puzzle pieces assembled by the subject pair during the play interaction.

RESULTS

Six sets of analyses were employed to evaluate the data recorded during the interactional sessions and from the audio tapes. Parental verbal and nonverbal instructional acts as well as consequential behaviors comprised the three sets of parental analyses. Child variables examined were verbal and nonverbal responses to the parent's instruction and the performance measures.

Prior to the analysis of the data, separate 2 (Sex of Parent) by 2 (Sex of Child) analyses of variance were performed on the parent's Otis Mental Abilities Test score and the child's Peabody score. None of the variables in these analyses reached significance.

Parental Verbal Instructional Variables

A 2 (Sex of Parent) by 2 (Sex of Child) by 2 (Type of Task) by 2 (Level of Instruction) by 3 (Style of Instruction) factorial analysis of variance was performed on the proportion of occurrence of the parental behaviors. The level and style of instruction of the behaviors were included in the analysis as repeated measures.

The analysis of parent instructional variables was characterized by the absence of a Sex of Parent effect. However, there was a significant effect of the Level of Instruction, $F(1,32)=4.27$, $p<.05$. Parents of both sexes engaged in more strategy level behaviors (Mean=.14) than specific level behaviors (Mean=.12). While the parent's sex was not significant, there was a significant interaction of the child's gender with the Level of Instruction, $F(1,32)=5.72$, $p<.05$. As shown in Table 2, parents of both sexes engaged in a larger proportion of strategy behaviors

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Insert Table 2 about here

(Mean=.15) than specific level behaviors (Mean=.11) while interacting with their male children. Moreover, parents utilized proportionately more specific (Mean=.13) than strategy (Mean=.12) level behaviors with their female children, although the difference between the means is very small.

In addition, there was a significant interaction of the Type of Task with the Style of Instruction, $F(2,64)=45.04$, $p<.001$, as shown in Table 3. Parents were found to engage in more suggestion behaviors during play while proportionately more explanation and asking were evidenced during the teaching session. It was further revealed, $F(2,64)=6.23$, $p<.05$, that the Level of Instruction interacted with the Type of Task and Style of Instruction. As shown by the upper part of Table 3, parents of both sexes engaged in proportionately more strategy level behaviors (Mean=.43) than specific behaviors (Mean=.34) while teaching their child the memory

task. By contrast, parents delivered the same proportion of specific

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Insert Table 3 About Here

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statements (M=.38) as strategy level statements (M=.38) during play.

Parental Consequential Variables

Behaviors on the part of the parent which occurred as a direct consequence of the child's action and imparted some information were analyzed. Feedback consisted of a parental interpretation of the child's performance with no value judgment, while approval and disapproval, in contrast, were more evaluative. Consequential variables were analyzed using a 2 (Sex of Parent) by 2 (Sex of Child) by 2 (Type of Task) by 3 (Consequential Behavior) analysis of variance with the three consequential variables included as repeated measures. A main effect of the Consequence Behavior was found, $F(2,32)=63.16$, $p<.001$. Parents of both sexes supplied more feedback (Mean=.18) than either approval (Mean=.05) or disapproval (Mean=.03). The parent's gender interacted significantly with the Type of Task, $F(1,32)=5.22$, $p<.05$. Mothers (Mean=.31) delivered proportionately more consequence behavior of all forms than fathers (Mean=.19) during the teaching session, while fathers (Mean=.27) were more consequential than mothers (Mean=.22) during play.

Finally, a significant two-way interaction of the child's sex with the Type of Consequence was found, $F(2,64)=3.94$, $p<.05$. As shown by the middle part of Table 2, female children received more feedback (Mean=.20) than males (Mean=.15) while male children were shown proportionately

greater approval (Mean=.06) and disapproval (Mean=.04) than females, (Means's=.04; .01, respectively).

Parental Nonverbal Style Behaviors

The parent's nonverbal style of interaction was scored during the interactions and was determined observationally from the body orientation and overall demeanor of the parent to the child.

A 2 (Sex of Parent) by 2 (Sex of Child) by 2 (Type of Task) by 3 (Nonverbal Style of Interaction) analysis of variance was conducted with the three nonverbal behaviors included as repeated measured variables. Again, there were no significant effects attributable to the parent's gender. However, a significant interaction of the child's sex with the Nonverbal Style of Interaction was found, $F(2,64)=3.48$, $p<.05$, and is reported in the lower portion of Table 2. Parents of both sexes engaged in more cooperative behaviors with their female children than with their male children. Furthermore, proportionately more directive and parallel behaviors were shown towards sons than daughters. A significant main effect was found for the Nonverbal Style of Interaction, $F(2,64)=74.28$, $p<.,001$, with parents exhibiting more cooperation (Mean=.59) than either direction (Mean=.28) or parallel (Mean=.12) behaviors.

A significant interaction between the Type of Task and the Nonverbal Style was also found, $F(2,64)=10.23$, $p<.01$. As seen in Table 3, more cooperative behaviors occurred than either directive or parallel behaviors during both types of interactional session. Teaching

interactions were characterized, however, by the near total absence of parallel activity.

Performance Measures

The child's total recall of the twenty-four cards and the amount of categorical clustering were assessed as the performance measures for the teaching task. The number of puzzle pieces assembled was scored as the performance measure for the play interaction. Separate 2 (Sex of Parent) by 2 (Sex of Child) analyses were performed on the number of puzzle pieces completed, child's total recall (pretest and post-test as repeated measures), and child's cluster score (pretest and post-test as repeated measures). There was a significant main effect of the child's gender on the number of puzzle pieces assembled, $F(1,32)=9.83$, $p<.05$. Male children connected more puzzle pieces (Mean=27.55) while interacting with their parents than did female children (Mean=18.28).

The analyses of variance which were performed on the recall and clustering performance measures were characterized by an absence of any effects involving the sex of the participants. A significant main effect was found, however, between pre and post-test for recall, $F(1,32)=29.86$, $p<.001$. Children recalled more items on the post-teaching evaluation (Mean=14.36) than on the pre-teaching test (Mean=10.03).

Additionally, a significant effect of clustering between pre and post-test was found, $F(1,32)-58.89$, $p<.001$. Children exhibited higher levels of categorical clustering after having been taught (Mean=64.0) as compared with the pre-teaching assessment (Mean=32.56).

THE DEMOGRAPHIC VARIABLES

The demographic questionnaire contained questions regarding the parent's age, number of other children in the home, and family income. Separate 2 (Sex of Parent) by 2 (Sex of Child) analyses of variance were performed for each of these variables. It was found, $F(1,32)=8.12$, $p<.01$, that fathers who participated in this study had attended more years of school (Mean=17.2) than the mothers (Mean=15.0).

DISCUSSION

The psychological literature suggests that mothers "know best" how to interact with their children. However, the results of this study clearly indicate that fathers are not only functionally similar to mothers in performance as teachers and playmates to their children, but they tend to employ behaviors which are stylistically the same. The finding that mothers and fathers behave in a remarkably similar manner may seem surprising in light of previous research (e.g., Margolin and Patterson (1975), Osofsky and O'Connell (1972)). Based upon the recent literature, it was expected that parents' behaviors would vary as a function of their own gender. This expectation was definitely not supported by the present data. In fact, there were no parental sex differences for instructional behavior or nonverbal involvement. The only difference attributable to the parent's sex was in terms of consequences delivered. Fathers delivered more consequences in the play setting whereas mothers delivered more consequences in the teaching situation. Margolin and Patterson found parental sex differences with regard to consequences in a naturalistic setting. Since in the present study the parental gender

effect depends upon the type of task, the generality of their finding is challenged.

The disparity between the general expectation and our findings regarding differences in parental behavior on the basis of gender may be partially attributable to the nature of the present tasks compared with those of past projects. The simultaneous presence of both parents and both children in past research created a context different from that achieved in the present two person interaction. There is experimental support in the infancy literature for the notion that mothers and fathers behave differently when interacting together with their child than when alone. For example, Parke and O'Leary (1976) report that fathers were more likely than mothers to hold and to verbally address the infant when alone whereas they engaged in fewer behaviors towards the child when the mother was present. Therefore, in order to test this explanation, future research should include observational comparisons of the family interacting dyadically and triadically on tasks of comparable difficulty and context.

The most important variable influencing the interactions appears to be the child's gender. In general, parents were performance and task oriented with their sons, teaching in a more strategic fashion, giving them qualitative judgments about their behavior, and interacting in a controlling manner. On the other hand, mothers and fathers were cooperative with daughters, supplying feedback and presenting instructions in a concrete and specific fashion. There are several classes of explanation for the finding that the child's gender was a

significant factor in the quality of parent-child interaction. This effect may be mediated by the child's cognitive competence, temperament, or the parent's attitudes and expectations for each sex of child.

The effect of the child's intelligence on the interactions could be explored, since PPVT data were obtained on the children. Although the analysis performed on the child's PPVT score was statistically nonsignificant, $F(1,30)=4.14$, $p<.10$, there was a tendancy for the male children to have higher scores than females. Therefore, the first alternative explanation to be explored was that parents responded to their child's level of intelligence by using more global problem-solving behaviors while instructing sons. By the same token, parents might be responding to the female child's lower intelligence in a concrete and specific manner. In order to test this alternative hypothesis, each of the analyses of variance which yielded significant sex of child effects or interactions were repeated using the child's Peabody score as a covariate. None of the analyses of covariance showed intelligence to be a significant covariate, and none of the other significant effects were changed by this analysis.

A second alternative hypothesis is that there were salient personality characteristics of the male children which prompted parents to instruct them in a more strategy oriented fashion. For example, the temperament of a child has been suggested as a factor which affects parent-child interactions (Thomas & Chess, 1977). Thomas and Chess, while observing parent-infant interactions, found that parental behaviors

such as consequences varied on the basis of their child's distractability and task-centeredness. There were no reports of these temperament variables differing with the sex of the child, yet Thomas and Chess speculate that future research will show gender to be related to temperament. The potential for gender-related temperament traits to be influencing the parents' styles of interaction is currently being explored by research in our laboratory.

A third alternative hypothesis holds that the parents in the present study were teaching their sons in a more strategic and judgemental manner than daughters because of socially reinforced attitudes about gender roles. There is empirical evidence to suggest that the above hypothesis is plausible. Radin and Epstein (Note 3) evaluated parental expectations of their children using a questionnaire. Radin and Epstein found that fathers have higher achievement expectations of their male children and generally anticipate that daughters will perform less well on problem-solving tasks. The Radin and Epstein investigation is limited in scope, however, by the fact that data were not also obtained from mothers.

In addition, Block, Block, and Harrington (Note 1) found that fathers were more concerned with achievement and the problem-solving aspects of the task when instructing sons than while working with daughters. Fathers of daughters, on the other hand, were observed to be less pressuring and have lower performance expectations. The researchers report no significant findings for the mother's behavior on the basis of the child's gender.

The general expectation that the child's performance would vary as a function of the parent's gender was not supported by the present data. Since no differences in instructional behaviors (i.e., Level and Style) were found on the basis of the parent's sex, it is unlikely that performance would vary along the same dimension.

Mothers and fathers were, however, very effective teachers of their sons and daughters. The child's memory performance as measured by both recall and clustering improved substantially after having been taught. Moreover, there was an improvement in the child's use of organizational strategies following the teaching session as revealed by post-hoc correlational analyses. Recall and clustering were negatively correlated on the pre-teaching test, although the coefficient was not significant. In contrast, there was a strong positive correlation (Pearson $r=.51$, $p<.01$) between recall and clustering on the post-teaching evaluation. This finding suggests that the interactions were effective in facilitating the child's use of organizational strategies to enhance memory.

Previous research projects involving mothers and their children with regard to teaching variables have focused on the role of socio-economic status and cognitive style in mediating the manner of instruction (Bee et al., 1969; Rollins, Goldstein, Jacobson, and Simon, Note 2). It is suggested, based upon the present data, that future research explore the child's gender as a variable which might determine the quality of information transmission within the parent-child interaction.

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TABLE 1

Parent/Child Behavior Dimensions Used to Score Interactions.

Dimensions	Behavioral Definitions
Parental Verbal Variables	
Provides Feedback	Parent interprets a child's performance (e.g., No, that was a dog.) (98%, 97%)
Provides Approval	Parent praises child on general performance beyond or in addition to providing feedback (e.g., You did so well.) (100%, 99%)
Provides Disapproval	Parent reacts negatively (verbally or physically to some response of the child (e.g., Stop acting silly! Pay attention! Sit up!) (93%, 93%)
Strategy Suggestion	Parent suggests a strategy to child (e.g., Let's put all the edges together.) (83%, 86%)
Strategy Explanation	Parent tells child something about the game (e.g., When I did this game, I put things together that go together.) (77%, 88%).
Strategy Asking	Parent asks child about strategy (e.g., What other animals are there (90%, 90%).
Specific Suggestion	Parent suggests that the child do something concrete (e.g., Put the dog next to the cat.) (77%, 85%)
Specific Explanation	Parent tells the child something about a single part of the task (e.g., This is a dog.) (80%, 90%)
Specific Asking	Parent asks child about a single part of the task (e.g., What is that picture?) (92%, 91%)
Parental Nonverbal Style	
Cooperation	Both parent and child work together on same portion of the task. (95%, 94%)

TABLE 1
(Continued)

Dimensions	Behavioral Definition
Directive	Parent not physically involved with the task, but directed and ordered the child's activities. (90%, 98%)
Parallel	Both parent and child worked on task, but were engaged with different parts of the project. (98%, 96%)
Child Verbal Variables	
Strategy Answer	Child answers parent's question with a global type of response (e.g., Those are all body parts.) (78%, 71%).
Strategy Comment	Child comments on task in global manner, but not in response to parent (e.g., These are all pictures of things to eat with.) (83%, 86%)
Strategy Asking	Child asks a strategy level question (e.g., Can I put all the animals together?) (98%, 94%).
Specific Answer	Child answers parent's question with a concrete response (e.g., That is a dog.) (76%, 66%).
Specific Comment	Child comments concretely, but not in response to parent's question (e.g., That is a red one.) (67%, 89%)
Specific Asking	Child asks a specific level question (e.g., What is that one called?) (94%, 100%)
Child Nonverbal Style	
Acceptance	Child complies with the parent without difficulty. (99%, 100%)
Rejection	Child is antagonistic toward the parent. (100%, 97%)
Neutrality	Child shows ambivalence toward the parent. (90%, 95%)

TABLE 2

The Proportion of Parental Level of Interaction, Delivery of Consequences, and Nonverbal Style of Interaction as a Function of the Child's Sex.

		Sex of Child	
		Male	Female
Parental Level of Instruction	Strategy	.15	.12
	Specific	.11	.13
Parental Delivery of Consequences	Feedback	.15	.20
	Approval	.06	.04
	Disapproval	.05	.01
Parental Nonverbal	Cooperative	.54	.65
	Directive	.33	.24
	Parallel	.13	.10

TABLE 3

		Type of Task	
		Male	Female
Parental Level of Instruction	Strategy	.38	.43
	Specific	.38	.34
Parental Style of Instruction	Suggestion	.16	.06
	Explanation	.12	.16
	Asking	.10	.16
Parental Nonverbal Style	Cooperation	.52	.66
	Directive	.26	.30
	Parallel	.20	.03